culturing said bacterium in the presence of lactose; and

retrieving a fucosylated oligosaccharide from said bacterium or from a culture supernatant of said bacterium.

12. The method of claim **11**, wherein said β-galactosidase gene comprises an *E. coli* lacZ gene.

13. The method of claim **11**, wherein said exogenous fucosyltransferase gene encodes α(1,2) fucosyltransferase or α(1,3) fucosyltransferase.

14. The method of claim **11**, wherein said enteric bacterium comprises *E. coli*.

15. The method of claim **14**, wherein said colanic acid synthesis gene comprises a wcaJ gene

16. The method of claim **14**, wherein said bacterium further comprises a mutation in a lon gene.

17. The method of claim **14**, wherein said bacterium comprises a functional, wild-type *E. coli* $lacZ^+$ gene inserted into an endogenous lon gene.

18. The method of claim **14**, wherein an endogenous lacZ gene of said *E. coli* is deleted.

19. The method of claim **14**, wherein said bacterium further comprises an exogenous rcsA or rcsB gene.

20. The method of claim **14**, wherein said bacterium further comprises a mutation in a lacA gene.

21. A method for producing a 3'-sialyl-3-fucosyllactose (3'-S3FL) in a bacterium,

said bacterium comprising a functional β-galactosidase gene, an exogenous sialyl-transferase gene, an exogenous fucosyltransferase gene, a GDP-fucose synthesis pathway, a deficient sialic acid catabolic pathway, a sialic acid synthetic capability, and a functional lactose permease gene;

culturing said bacterium in the presence of lactose; and

retrieving said 3'-S3FL from said bacterium or from a culture supernatant of said bacterium.

22. The method of claim **21**, wherein said exogenous sialyl-transferase gene encodes α(2,3)sialyl-transferase.

23. The method of claim **21**, wherein said exogenous fucosyltransferase gene encodes α(1,3) fucosyltransferase.

24. The method of claim **21**, wherein said deficient sialic acid catabolic pathway comprises a null mutation in endogenous N-acetylneuraminate lyase or N-acetylmannosamine kinase genes.

25. The method of claim **21**, wherein said sialic acid synthetic capability comprises an exogenous UDP-GlcNAc 2-epimerase gene, an exogenous Neu5Ac synthase gene, or an exogenous CMP-Neu5Ac synthetase gene.

26. A method for producing a 3'-sialyl-3-fucosyllactose (3'-S3FL) in an enteric bacterium,

said enteric bacterium comprising a functional lacZ gene, an exogenous fucosyltransferase gene, an exogenous sialyltransferase gene, a mutation in an endogenous colanic acid synthesis gene, a functional lactose permease gene, a deficient sialic acid catabolic pathway, and sialic acid synthetic capability;

culturing said bacterium in the presence of lactose; and

retrieving said 3'-S3FL from said bacterium or from a culture supernatant of said bacterium.

27. The method of claim **26**, wherein said exogenous fucosyltransferase gene encodes α(1,3) fucosyltransferase.

28. The method of claim **26**, wherein said exogenous sialyltransferase gene encodes an α(2,3)sialyl transferase.

29. The method of claim **26**, wherein said deficient sialic acid catabolic pathway comprises a null mutation in endogenous N-acetylneuraminate lyase or N-acetylmannosamine kinase genes.

30. The method of claim **26**, wherein said sialic acid synthetic capability comprises an exogenous UDP-GlcNAc 2-epimerase gene, an exogenous Neu5Ac synthase gene, or an exogenous CMP-Neu5Ac synthetase gene.

31. A method for phenotypic marking of a gene locus in a host cell, whose native β-galactosidase gene is deleted or inactivated, by utilizing an inserted recombinant β-galactosidase gene engineered to produce a low but detectable level of β-galactosidase activity.

32. A method for depleting a bacterial culture of residual lactose in a β-galactosidase negative host cell, whose native β-galactosidase gene is deleted or inactivated, by utilizing an inserted recombinant β-galactosidase gene engineered to produce a low but detectable level of β-galactosidase activity.

33. A method for detecting bacterial cell lysis in a culture of a β-galactosidase negative host cell, whose native β-galactosidase gene is deleted or inactivated, by utilizing an inserted recombinant β-galactosidase gene engineered to produce a low but detectable level of β-galactosidase activity.

34. A method of purifying a fucosylated oligosaccharide produced by the method of claim **1**, comprising binding said fucosylated oligosaccharide from a bacterial cell lysate or bacterial cell culture supernatant of said bacterium to a carbon column, and eluting said fucosylated oligosaccharide from said column.

35. An isolated *E. coli* bacterium comprising a defective colanic acid synthesis pathway, reduced level of β-galactosidase activity, and an exogenous fucosyl transferase gene.

36. A purified fucosylated oligosaccharide produced by the method of claim **1**.

37. A nucleic acid construct comprising an exogenous fucosyltransferase gene transformed into a bacterial host strain comprising a deleted endogenous β-galactosidase gene, a replacement functional β-galactosidase gene of low activity, a GDP-fucose synthesis pathway, a functional lactose permease gene, and a deleted lactose acetyltransferase gene.

38. The nucleic acid construct of claim **37**, wherein said exogenous fucosyltransferase gene encodes α(1,2) fucosyltransferase or α(1,3) fucosyltransferase.

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